

# Effect of Alignment on Text Cohesion in the Continuation Task

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## Abstract

A continuation task provides learners with a text with its ending removed and requires them to complete it through writing in a most coherent and logical way. The current study investigated (a) whether the continuation task had a positive effect on text cohesion and (b) whether texts produced by pairs exhibited higher cohesion than those produced by individual learners. A total of 80 college students were randomly assigned to one of three task conditions: 1) 40 students working in pairs in a continuation task; 2) 20 working individually in a continuation task; and 3) 20 working individually in a picture writing task. Text cohesion was analyzed by using three indices from Coh-metrix: Argument Overlap, Latent Semantic Analysis, and Causal Cohesion. Moreover, the collaborative dialogue and think-aloud protocols were collected and transcribed for identifying language-related episodes (LREs). The results showed that learners in Condition 1 produced the highest text cohesion while those in Conditions 3 the lowest. Furthermore, learners in Condition 1 produced more cohesion-related LREs, especially proportionally more correctly resolved LREs than those in Conditions 2 and 3. The implications of these findings from the perspective of alignment are discussed.

**Keywords:** the continuation task, cohesion, alignment, collaborative writing

## 1. Introduction

The alignment concept stems from Pickering and Garrod's (2004) study on first language dialogue (Jiang, 2015). They defined alignment as the adaptation of mental representations at various levels (e.g., situational and linguistic levels) between interlocutors, which is crucial to success, smooth communication. Take alignment at the syntactic level as an example, if A said *John gave me a piece of cake*, B would be more likely to describe a subsequent event with the same structure like *The students gave the teacher a surprise* instead of an alternative structure *The students gave a surprise to the teacher*. Alignment at the syntactic level is specifically called *Syntactic Priming* (Note 1) (Bock, 1986). In the past decade a few second language (L2) acquisition studies have employed syntactic priming to examine interaction activities in L2 development, and found that syntactic priming played a beneficial role in L2 development. For example, McDonough (2006, 2008) investigated the effect of syntactic priming on English-as-a-second-language (ESL) question development. They assumed that encountering a developmentally advanced question form might encourage the subsequent use of that form as opposed to the less advanced form. The results from both studies indicated that learners showing syntactic priming were more likely to advance to a higher stage in the developmental sequence of question formation.

Atkinson, Nishino, Churchill and Okada (2007) further developed the notion of alignment by claiming that alignment existed not only between human beings, but also between human beings and their social and physical environment. In their study, they focused on the coordinated activities of a Japanese Junior high school student with her tutor in learning of the present perfect tense *have you ever*. It was showed that they "aligned not just with each other, but with a rich array of sociocognitive tools and affordances", such as tables, pens, grammar books, and so on (p. 185). Atkinson therefore emphasized that the multidimensional alignment was a necessary and crucial requirement for L2 development with the more alignment the better.

Enlightened by Atkinson's align-to-learn theory, a continuation task involving learner-text alignment was put forward by C. Wang and M. Wang (2015) to help L2 learners write effectively. In the continuation task learners are provided with a text with its ending removed and required to complete it through writing in a most coherent and logical way (C. Wang & M. Wang, 2015). To meet the requirements, learners have to align dynamically with the text in both content and language to make sure what is currently being written goes well with what has gone

before. Apart from modeling on the text, the writer has to employ his or her creativity to develop new ideas in the continuation, thus creating a learner-generated, original context, which can motivate learners' communicative needs, and ultimately drive language development. Overall, writing of this kind is an interactive, creative, and dynamic process.

It is generally admitted that there is always a gap between comprehension and production ability (Wang, 2011, C. Wang & M. Wang, 2015). L2 learners can comprehend more than what they can produce as rich contextual knowledge is available to aid comprehension, while production in response to comprehension is often constrained by limited linguistic representations. However, when the processes of comprehension and production draw upon the same representations just like in dialogue (Pickering & Garrod, 2004), learners tend to use what has been comprehended for production, an efficient way to bridge the gap between comprehension and production. In a similar vein, the continuation task closely coupling comprehension with production can achieve the same effect, given that "upon encountering difficulty in language use, learners can have access to constructions immediately available in the preceding text" (C. Wang & M. Wang, 2015, p. 523).

The past five years have seen an increase in L2 researchers' interest in the continuation task. The extant research has mainly focused on the alignment effect it involves. C. Wang and M. Wang (2015) explored to what extent L2 learners aligned with the input text in the continuation task and how alignment influenced L2 writing. Two groups of 24 Chinese EFL learners were required to continue in English two stories without endings. Each story had a Chinese as well as an English version. Results showed that when participants continued the English version of the stories, the words in the original text frequently appeared in their writings and thus significantly fewer errors were committed in comparison with their performance on the Chinese version. Furthermore, a couple of studies explored the variables influencing the alignment effect of the continuation task, such as interestingness (Xue, 2013) and linguistic complexity (Peng, 2015) of an input text, the presence/ absence of an input text during writing (Xiao, 2013), task instructions (Yuan, 2013), and peer interaction (Pang, 2014).

To date, only one study has directly investigated the effect of the continuation task on L2 development. Jiang and Chen (2015) investigated the long-term effect of the continuation task on L2 writing with a pretest–treatment–posttest structure. Two groups were formed: one group wrote following text reading in six continuation tasks (i.e., the continuation group), and the other wrote on six given topics without text reading (i.e., the topic-given writing group). During each testing session: a picture writing test and a free writing test were conducted to measure participants' improvement in writing in terms of linguistic accuracy, complexity, and fluency. The results showed that the continuation group generated significantly more gains in accuracy and complexity than the topic-given writing group, although there was no significant difference in fluency.

To sum up, the alignment effect emanating from the continuation task can facilitate L2 learning with the more alignment the better. However, the question of how to promote alignment in the continuation task is still under-researched and needs further exploration. The current study made an attempt on this issue by expanding alignment in the continuation task from learner-text perspective to include learner-learner perspective, and focusing on its effect on text cohesion.

## 2. Studies on Collaborative Writing

Collaborative writing is defined by Belcher (1990) as two or more people working together to produce a written document. He stated that collaborative writing groups constituted genuine reading audiences for each of the writers within the group, and people could write with the needs and characteristics of audiences in mind as they composed and revised texts. By engaging in this social process of writing, one can experience more opportunities to review and apply his or her growing knowledge through interaction with others in the writing group.

The extant research has proved the effectiveness of cooperation in L2 writing. Storch (2005) compared the writings produced by two groups of fairly advanced ESL learners who were given the choice to work on a writing task individually or in pairs. 18 students chose to work in pairs, and five worked individually. The task used in the study was a data commentary text. Students were given a graphic prompt and asked to compose a short (one to two paragraphs) text. All the texts produced were analyzed in terms of fluency (the total number of words), accuracy (the proportion of error-free clauses of all clauses, and the number of errors per word), and complexity (the proportion of clauses to T-units, and the proportion of dependent clauses to clauses). The texts were also assessed globally using a 5-scale scheme that took content, structure, and task fulfillment into consideration. The results showed that learners working in pairs produced shorter texts with more accurate and complex language than those working individually. Moreover, texts produced by pairs had a better structure and

a clearer focus than those produced by individual learners. In a follow-up study, Storch and Wigglesworth (2007) increased the number of participants to 144, and changed the task into an argumentative writing task. The results indicated that there were no significant differences in linguistic fluency and complexity between pairs and individual learners, but pairs produced more accurate texts than individuals.

Kim (2008) compared the relative effects of collaborative and individual writing on L2 vocabulary learning by Korean ESL learners with a pretest-treatment-posttest-delayed posttest structure. 16 participants completed a dictogloss in pairs, and 16 worked individually while thinking aloud. The collaborative dialogue and think-aloud protocols were transcribed and analyzed for identifying language-related episodes (LREs). The results showed that although there was no significant difference in the number of LREs produced by pairs and individuals, pairs had more correctly resolved LREs than individuals. Moreover, pairs outperformed individuals in the vocabulary posttests.

In addition, some studies examined L2 learners' attitudes to collaborative writing. Storch (2005) was one of the first studies to address this issue. Among the 18 interviewed students who completed a writing task in pairs, 16 showed very positive attitudes and believed that writing in pairs helped to pool their resources, observe each other, and learn different ways of expressing the same ideas. They specifically stated that collaboration was helpful for linguistic accuracy and L2 vocabulary learning. However, of the 16 students who expressed positive attitudes, five had some reservations which stemmed from a lack of confidence in their own language skills and concern about criticizing others. For those (two students) against collaborative writing, they stated that writing was an inherently individual task, and pair work was more suited for oral activities.

Shehadeh (2011) asked two classes of English-as-a-foreign-language (EFL) learners to complete the same writing assignments over a semester with one class working individually and the other in pairs. Most pairs reacted positively to the collaborative writing experience, as they stated that collaborative writing enabled them to generate ideas, pool ideas together, discuss and plan, generate their text collaboratively, provide each other with immediate feedback, and put their text in a better shape.

In sum, collaborative writing is conducive to L2 learning by improving language competence, writing skills, and even self-confidence as well as speaking abilities. The current study deepened our understanding of the effect of collaboration on L2 writing by exploring its effect on text cohesion.

### 3. Studies on Text Cohesion

Halliday and Hasan (1976) defined cohesion as the grammatical and lexical linking within a text or sentence that held a text together and gave it meaning. They distinguished cohesion into five categories: reference, substitution, ellipsis, conjunction, and lexical cohesion. Reference includes personal reference, demonstrative reference, and comparative reference. Substitution involves nominal substitution, verbal substitution, and clausal substitution. Ellipsis refers to nominal ellipsis, verbal ellipsis, and clausal ellipsis. Conjunction consists of additive conjunction, adversative conjunction, causal conjunction, and temporal conjunction. Lexical cohesion refers to the way in which related words are chosen to link elements of a text.

So far, some research was conducted to examine the relationship between cohesion and writing quality. For example, by comparing five good writings with five poor writings of first-year college students, Witte and Faigley (1981) claimed that cohesive density, especially the function of reference, synonymy, and collocation, could distinguish good writing from poor writing. Jin (2001) analyzed the use of demonstrative reference, conjunctions, and lexical repetition in Chinese graduate students' writing, and found that the advanced learners used more of the devices than the intermediate learners did. In sum, the positive relation between cohesion and writing proficiency has been validated. From a pedagogical point of view, there is clearly a need for research that helps to identify the types of writing task which can enhance L2 learners' text cohesion.

In the above studies, the effect of cohesion was investigated by manipulating cohesive cues in the text, and the adopted samples were relatively small in size. When more samples are required, it is difficult to keep track of the various sources of cohesion by manual annotation. Researchers in the University of Memphis developed a computational tool called *Coh-metrix* that can produce indices of the linguistic and discourse representations of a text. These values can be used in many different ways to investigate the cohesion of a text. *Coh-metrix* has a list of 108 indices to meet the growing need for comprehensive and automatic text analyses, and its validity in assessing cohesion has been confirmed by several studies (e.g., Liang, 2006). This study employed *Coh-metrix* to analyze text cohesion of Chinese EFL learners.

## 4. The Study

### 4.1 Research Questions

The following two research questions were formed to guide the study:

- 1) Does the continuation task have an effect on text cohesion?
- 2) If yes, do the texts produced by pairs exhibit higher cohesion than those produced by individual learners?

### 4.2 Participants

Altogether 80 sophomores majoring in English at a University in China participated in this study. They were randomly assigned to one of three task conditions: 1) 40 working in pairs in a continuation task; 2) 20 working individually in a continuation task; and 3) 20 working individually in a picture writing task. An English proficiency test, namely the Quick Placement Test (UCLES, 2001) was administered to them. The mean scores showed no significant group differences and they were all at the upper intermediate level. Participants in Condition 1 were further divided into 20 pairs based on their score ranking in an English writing course with the first and the second forming a pair, the third and the fourth forming a pair and so on.

### 4.3 Instruments

#### 4.3.1 Reading Materials

The reading material for the continuation task (Conditions 1 & 2) was an incomplete fiction story named *Chon* written by Bernard Jackson and Susie Quintanilla, which narrated a single mother Mary's experience of coming across aliens who were looking for a woman called Chon. The input text totally had 951 words. The material for the picture writing task (Condition 3) was three successive pictures which described the incomplete story of *Chon* (see Figure 1).

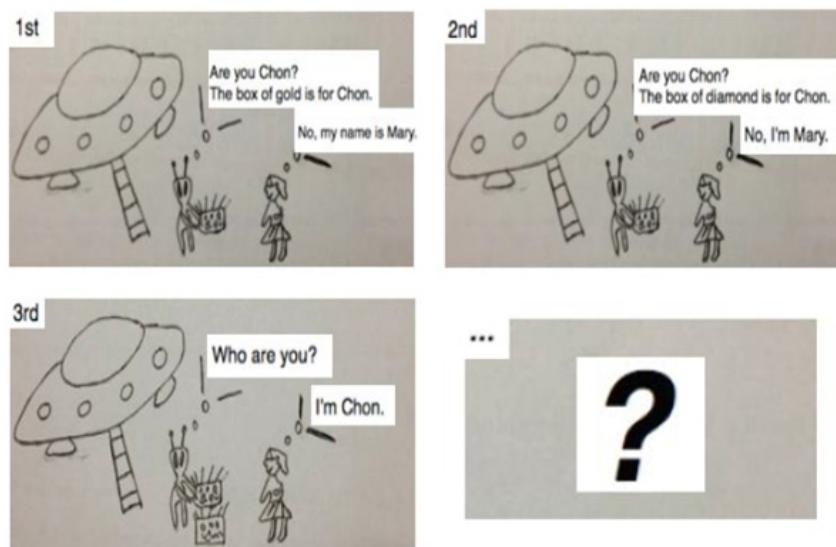


Figure 1. Pictures used in the picture writing task

#### 4.3.2 Tasks

The continuation task required participants to read the input text and write an ending for it in a most logical and coherent way. Participants completed the task in pairs in Condition 1 and individually in Condition 2. Collaborative dialogue of five pairs in Condition 1 were videotaped for further analysis. The picture writing task provided three consecutive pictures and required participants to write an ending for what happened in the pictures. Time on task was 70 min for Condition 1, 60 min for Condition 2, and 45 min for Condition 3. These time limits were ensured by a pilot study.

#### 4.3.3 Think-Aloud

The think-aloud method was employed as another tool to glean data. five students were selected from Conditions 2 and 3 respectively to vocalize what was going through their minds as they were performing the task. There was

a training and practice session before the experiment to ensure these ten participants know how to do think-aloud. Data collecting was individually carried out in a sound-attenuated room with the process videotaped. The data involving cohesion-related LREs were retrieved for further analysis.

#### 4.4 Data Analysis

Two types of data were analyzed: participants' written texts and transcripts of the videotapes.

##### 4.4.1 Written Texts

Altogether there were 60 texts collected with 20 from each task condition. The texts were typed into a computer to yield three small-size corpora. Coh-metrix 3.0 was employed to calculate text cohesion by using three indices, namely, Argument Overlap, Latent Semantic Analysis (LSA)-ass, and Causal Cohesion. Argument Overlap occurs when there is overlap between a noun in one sentence and the same noun (in singular or plural form) in another sentence; it also occurs when there are matching personal pronouns between two sentences (e.g., he/he).

LSA-ass computes semantic overlap for adjacent, sentence-to-sentence (abbreviated as "ass") units. In other words, this measures how conceptually similar each sentence is to the next sentence, as shown in the following example.

Example:

*Text 1: The field was full of lush, green grass. The horses grazed peacefully. The young children played with kites. The women occasionally looked up, but only occasionally. A warm summer breeze blew and everyone, for once, was almost happy.*

*Text 2: The field was full of lush, green grass. An elephant is a large animal. No-one appreciates being lied to. What are we going to have for dinner tonight?*

In the example above, Text 1 records much higher LSA scores than Text 2. The words in Text 1 tend to be thematically related to a pleasant day in an idyllic park scene: green, grass, children, playing, summer, breeze, kites, and happy. In contrast, the sentences in Text 2 tend to be unrelated.

Causal Cohesion is a ratio of causal particles to causal verbs. The denominator is incremented by the value of 1 to handle the rare case when there are 0 causal verbs in the text. Cohesion suffers when the text has many causal verbs (signifying events and actions) but few causal particles that signal how the events and actions are connected.

##### 4.4.2 Transcripts

The videotapes were transcribed by the researcher for identifying LREs. According to Swain and Lapkin (1998), an LRE is defined as any part of a dialogue where students talk about the language they are producing, question their language use, or correct themselves or others. This study expanded the notion of the LRE from dialogue to include monologue in think-aloud and focused on cohesion-related LREs from two dimensions: focus and outcome. In terms of focus, they were divided as Argument Overlap, LSA-ass, and Causal Cohesion. In terms of outcome, they were classified as Correctly Resolved, Incorrectly Resolved, and Unresolved.

## 5. Results

### 5.1 Results on Text Cohesion

To answer the first research question, comparisons were made between the texts produced by participants working individually in the continuation task (Condition 2) and those by participants working individually in the picture writing task (Condition 3) on three indices of cohesion. The descriptive statistics for both conditions are displayed in Table 1. The independent samples t-tests showed that participants in Condition 2 recorded significantly higher scores than those in Condition 3 in Argument Overlap ( $t=8.933, p<0.001$ ), LSA-ass ( $t=7.908, p<0.001$ ), and Causal Cohesion ( $t=5.253, p<0.001$ ). These findings indicate that the continuation task has an beneficial effect on text cohesion.

Table 1. Descriptive statistics for conditions 2 and 3 (M=mean; SD=standard deviation)

Task Condition	Argument Overlap		LSA-ass		Causal Cohesion	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
2	0.496	0.05	0.128	0.05	0.515	0.85
3	0.307	0.08	0.118	0.01	0.346	0.19

To answer the second research question, comparisons were made between the texts produced by participants writing individually in the continuation task (Condition 2) and those by participants writing in pairs in the continuation task (Condition 1) on three indices of cohesion. The descriptive statistics for both conditions are displayed in Table 2. The independent samples t-tests showed that participants in Condition 1 outperformed those in Condition 2 in Argument Overlap ( $t=11.675, p<0.001$ ), LSA-ass ( $t=3.074, p<0.001$ ), and Causal Cohesion ( $t=4.482, p<0.001$ ). These findings indicate that collaborative writing can promote text cohesion.

Table 2. Descriptive statistics for conditions 1 and 2 (M=mean; SD=standard deviation)

Task Condition	Argument Overlap		LSA-ass		Causal Cohesion	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1	0.679	0.49	0.132	0.05	0.607	0.49
2	0.496	0.05	0.128	0.05	0.515	0.85

### 5.2 Results on LREs

To further explore the results obtained above, data on cohesion-related LREs were analyzed. Table 3 shows the descriptive statistics for LREs in terms of focus. Clearly, participants paid different attention to cohesion in three task conditions with participants in Condition 1 producing the most cohesion-related LREs ( $n=101$ ) while those in Condition 3 the least ( $n=58$ ). Additionally, in each task condition the largest proportion of the LREs related to Causal Cohesion while the least proportion was Argument Overlap.

Table 3. Descriptive statistics for cohesion-related LREs in terms of focus

Focus	Condition 1	Condition 2	Condition 3
Argument Overlap	21 (21%)	16 (19%)	13 (22%)
LSA-ass	38 (38%)	32 (38%)	19 (33%)
Causal Cohesion	42 (41%)	36 (43%)	26 (45%)
Total	101	84	58

Table 4 shows the descriptive statistics for LREs in terms of outcome. Although in each task condition the correctly resolved LREs took up the largest proportion, clear group differences were observed. Specifically, participants in Condition 1 produced proportionally more correctly resolved LREs than those in Conditions 2 and 3. Likewise, participants in Condition 2 produced proportionally more correctly resolved LREs than those in Condition 3. These findings further back up the above results on text cohesion.

Table 4. Descriptive statistics for cohesion-related LREs in terms of outcome

Outcome	Condition 1	Condition 2	Condition 3
Correctly Resolved	75 (74%)	50 (60%)	26 (45%)
Incorrectly Resolved	16 (16%)	16 (19%)	14 (24%)
Unresolved	10 (10%)	18 (21%)	18 (31%)
Total	101	84	58

## 6. Discussion and Conclusions

The first research question asked whether the continuation task had a positive effect on text cohesion. The results showed that participants working individually in the continuation task (Condition 2) produced higher text cohesion than those working individually in the picture writing task (Condition 3), thus lending support to the effect of the continuation task on text cohesion. In the continuation task, learners were required to read an incomplete story and complete it as coherently and logically as possible. This task is not a pure writing task but

an integration of comprehension with production. When performing the task, learners needed to align with the original text at various levels, including the situational levels to write consistently in plot, and the linguistic levels to write in conformity with the manner and style of the original text. It was often to see that most participants in Condition 2 marked the connectives, synonymies, re-occurrent nouns and pronouns in their reading materials, indicating that cohesion, an important feature of language, was attached great importance.

By contrast, the picture writing task presented the preceding plots in the form of three pictures. Therefore, learners only needed to align with those pictures at the situational levels to write consistently in plot. As for language, there was no input text for them to comprehend and then to align with. As a result, they would put much effort into the creation of content while less emphasis on language form. One case in point is text cohesion. It was clear to see that participants in Condition 3 produced less cohesion-related LREs than those in Condition 2, suggesting that they did not pay as much attention to cohesion as those did in Condition 2.

In addition, participants working individually in the continuation task (Condition 2) had a more efficient way to solve the cohesion-related problems than those working in the picture writing task (Condition 3), as they produced proportionally more correctly resolved LREs. Upon encountering difficulty in cohesion, participants in Condition 2 could turn to the input text for help. For example, one participant wanted to describe the change of the protagonist's feeling in her writing, but totally had no idea about how to do it. So she read the material again and found some descriptions about the change of environment *Mary watched the winter sunlight dancing in the leafy trees, and a cool breeze blew*. She believed that the environmental change could imply the change of one's feeling and therefore adopted the sentence into the continuation (*Mary waited for the bus happily. She watched the winter sunlight dancing in the leafy trees. A cool breeze blew. She began to feel a little uneasy and started to sweat*), which made her writing flow smoothly. In sum, picking up similar expressions from the original text made their writing semantically related, and therefore promoted the text cohesion.

On the contrary, participants working in the picture writing task had no input text to refer to when they were confused about the cohesion problems. The only resource they had was their previous knowledge. However, sometimes, it was too limited to help them solve the problems. In this case, they either gave up or solved them incorrectly, as the current study showed that the proportion of unresolved or incorrectly resolved LREs in Condition 3 were relatively higher than that in Condition 2. For example, one participant in Condition 3 did not know how to express *hardship* in English. So she had to disregard it in her writing *As a tradition, we often help people in need out of trouble. One day, our king hung over the garden and happened to see you, so he sent us here*. But if she had had the input text to read, she could have found the word *hardship* (*Mary sighed, no one could understand her hardship*), and might have revised her sentence as the following *As a tradition, we often help people in need out of trouble. One day, our king hung over the garden and happened to see your hardship, so he sent us here*. Given that the word *hardship* is semantically related to the word *trouble* in her sentence, using this word can definitely benefit the cohesion value of her writing.

The second research question compared the text cohesion produced by participants writing in pairs (Condition 1) and individually (Condition 2) in the continuation task. The findings indicate that the texts completed by pairs were more coherent than those by individual participants. In Condition 1 participants worked collaboratively to construct the continuation, which provided a good chance for L2 learning to take place. This is because in collaborative activities learners had a positive impact on each other's development as they could act as both novices and experts (Ohta, 2000, 2001; Storch, 2002; Swain & Lapkin, 1998). Compared to individual writing, collaborative writing pushed learners to reflect more on language as well as content not only for the sake of being in harmony with the original text but also for the collective responsibility. They questioned each other, discussed their writing, and modified it when necessary. For example, one participant of a writing pair at first wrote *Soon they lived together under the gorgeous roof happily until one morning when she woke up, the man was gone, together with her money*. His partner soon realized that the use of *the man* could not clearly indicate his identity, thus suggesting to substitute *her lover* for it to respond to the foregoing statement *Mary fell in love with the man*. This change made their writing clearer, and more importantly, enhanced the text cohesion.

To sum up, the current study found that the continuation task had a significant positive effect on text cohesion. When the task was completed by pairs, the cohesion value could be greatly enhanced. To further explore the reasons, cohesion-related LREs from collaborative dialogue and think-aloud protocols were analyzed. It was showed that participants working collaboratively in the continuation task produced more cohesion-related LREs, especially proportionally more correctly resolved LREs than those in other two task conditions. These findings can be attributed to the different resources of alignment. In the continuation task, participants aligned with input text when working individually, and with their partners as well as the input when working collaboratively. In comparison, participants working individually in the picture writing task could only align with their own

knowledge when encountering cohesion-related problems. The different resources of alignment ultimately led to the different results on text cohesion. The implication for teaching here is that L2 teachers and learners should attach importance to collaborative learning, since it creates more opportunities for learners to question their language use, test and confirm hypotheses, offer and assess new input, and provide both positive and negative feedback to each other.

Finally, like other empirical studies, this one is not without limitations. One limitation involves the long-term effect of alignment on text cohesion. From a one-time experiment, the current findings just showed the immediate effect of alignment on cohesion. There is a need to look into its long-term effect by conducting a longitudinal study. Only in this way can the role of alignment in text cohesion be clarified. Another limitation concerns the arrangement of pairs. In the study, although participants were paired up according to their score ranking in an English writing course with the first and the second forming a pair, the third and the fourth forming a pair and so on, they were all at the same upper-intermediate level based on their scores in the English proficiency text. In future research learners at different levels may pair up to explore the effect of collaboration on text cohesion.

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### Note

Note 1. Structural priming is a speaker's tendency to reuse the same structural pattern as one that was previously encountered (Bock, 1986).

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